Melanism is the excessive dark pigmentation of the integument in animals, determined by genetics (mutations) or environmental factors (modifications). This chromatic anomaly in individuals may be partial or complete, and populations may reflect a mixture of melanistic and normally patterned animals (Lillywhite, 2001). Dark colour morphs have been reported to occur in a variety of different animal groups, including reptiles (Gibson and Falls, 1979, 1988; Schulz and Philippen, 1987; Mouton and Oelofsen, 1988; Kolösses and Nagy, 2006; Portik et al., 2010), and are frequently observed at high elevations (e.g., Bašić and Zimić, 2016) or latitudes (e.g., Kuranova, 1989) as a result of thermoregulatory benefits. In snakes, melanism has been well documented and studied in many families within the advanced snakes of the superfamily Colubroidea (Al-Mohanna et al., 1997; Tanaka, 2005; Zadravec and Lauš, 2011 – Colubridae; Price, 2009; Das, 2015; Goirán et al., 2017 – Elapidae; Murphy, 2011; Murphy et al., 2012 – Homalopsidae; Branch et al., 2014 – Lamprophiidae; Gibson and Falls, 1979, 1988; Zadravec and Lauš, 2011; Gvozdenović and Schweiger, 2014; Bašić and Zimić, 2016 – Natricidae; Naulleau, 1973; Klauber, 1982; Andrén and Nilson, 1981; Luiselli et al., 1994; Forsman, 1995; Broennimann et al., 2014; Speybroek et al., 2016 – Viperidae). In the more basal snake families, complete melanism has, to our knowledge, not been reported in wild specimens or museum-preserved vouchers collected in the field, although captive-produced melanistic morphs are common among boas and pythons (Stafford, 1986; Andrade and Abe, 1998; Bartlett and Bartlett, 2003; Mattison, 2007; O’Shea, 2007; Roots, 2007).

The monotypic snake family Cylindrophiidae Fitzinger, 1843 currently comprises 13 species of piped snakes, widely distributed from mainland Southeast Asia south to the Moluccas (Amarasinghe et al., 2015; Kieckbusch et al., 2016). Populations of Cylindrophis ruffus (Laurenti, 1768) sensu lato (see Kieckbusch et al., 2016 for a definition of the taxon) exhibit a conspicuous colour pattern of pale and dark bands on the underside. The dorsum is dark but iridescent, with lighter blotches (cream to red) especially prominent in juveniles. Lighter dorsal blotches or bands may be present at the nape of the neck. The blunt tail has reddish colouration (especially on the underside), and is inverted, flattened, and displayed when threatened (Amarasinghe et al., 2015; Kieckbusch et al., 2016).

We here report a case of melanism in Cylindrophis ruffus sensu lato. The specimen was collected in November 1912 in the Singapore Botanical Gardens (1°18′54″N 103°48′58″E) and deposited in the Zoological Reference Collection of the Lee Kong Chian Natural History Museum (specimen number: ZRC 2.3021; Fig. 1). The voucher is an unsexed adult, exhibiting a snout-vent length of approx. 300 mm and a tail length of 8 mm. It possesses 19/21/17 dorsal scale rows, 206 ventral and six subcaudal scales. The specimen shows a black colouration on the entire body, including the underside (Fig. 1). It is the first record of a completely melanistic specimen in the genus Cylindrophis and likely a first record for a completely black snake within the Henophidia Hoffstetter, 1939 collected in the field.

It is with some surprise that we realized that the occurrence of complete melanism in henophidian snakes appears not to have been reported to date (with the exception of captive-bred cultivars intended for the pet trade (S.M., pers. obs.).
We believe that melanism in these snakes might occur more frequently in wild populations (with juveniles hatching in a frequency similar to that in captive populations), but that melanistic colour morphs have fitness disadvantages, with selection working against this variation. These disadvantages may manifest themselves in *Cylindrophis*, where the ventral and especially the subcaudal colouration is considered to be an effective aposematic signal (see previous page) and its loss may make completely dark pipesnakes prone to predation. From a pool of genetic colour morphs, the morphs best adapted to their environment (presumably the ones with aposematic colouration) are most common, but the gene pool is apparently large enough to allow shifts in colour. Members of the *Cylindrophis burmanus* (Smith, 1943) complex for example usually have a diffuse ventral pattern with a high level of dark pigmentation that rarely includes complete bands. The aposematic red colouration on the undersurface of the tail, however, is remained, which is most important in the defensive strategy of these snakes.

The presence of melanism in snakes from Maritime Southeast Asia is rarely reported and the low level of reporting might represent a bias. De Rooij (1917) reported entirely black specimens of *Calamaria virgulata* (Boie, 1827; Colubridae) and *Macropisthodon flaviceps* (Duméril et al., 1854; Colubridae), as well as of *Naja sputatrix* (Boie, 1827; Elapidae) from Java (see also McKay, 2006). All-black *Bungarus candidus* (Linnaeus, 1758; Elapidae) from Java were described as a separate species, *B. javanicus*, by Kopstein (1932) but are now known to represent a melanistic variant (Slowinski, 1994; Kuch and Mebs, 2007) that is also found on Bali (Andrew Kathriner, in litt.) Today, many parts of Southeast Asia are easier to access and much better explored than in the days of De Rooij and Kopstein. Natural history observations such as melanistic specimens are, however, more likely to be posted on the social media or in online photo communities, than properly documented and submitted for publication as a permanent record (see O’Shea and Kelly, 2017).

Examples may include melanistic *Boiga cynodon* (Boie, 1827; Colubridae) that have been documented as occurring in Malaysia (Teo Eng Wah, in litt.). More research on melanistic snakes in Maritime Southeast Asia is needed in order to clarify the frequency of occurrence and distribution of melanistic snakes in this region.

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4 Species endemic to highlands, such as *Simalia boeleni* (Brongersma, 1953) from New Guinea, may be largely blue-black, though not melanistic. Adult specimens of the *Python curtus* group can be very dark as well, while juveniles are normally coloured (ontogenetic colour change, see Keogh et al., 2001). Many uropeltids are also monocoloured and very dark, but not entirely black.

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**Figure 1.** Melanistic *Cylindrophis ruffus* (ZRC 2.3021) in different views. Photos by Simon Föster.
First record of a melanistic specimen of *Cylindrophis ruffus* sensu lato


Araneomorpha: Theridiidae), with a review of other *Latrodectus* predation events involving squamates. Herpetofauna (Australia) **44**: 49–55.


